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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,287	04/24/2001	Kevin Albert Maher	5659-03800/EBM	5477

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[REDACTED] EXAMINER

KRECK, JOHN J

ART UNIT	PAPER NUMBER
	3673

DATE MAILED: 06/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/841,287	MAHER ET AL.
	Examiner	Art Unit
	John Kreck	3673

HN

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 17 April 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1727-1804 and 5396-5407 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1727-1734, 1736-1773, 1775-1804 and 5396-5407 is/are rejected.
- 7) Claim(s) 1735 and 1774 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 16 19 23 24
- 4) Interview Summary (PTO-413) Paper No(s) _____
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other:

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/14/03 has been entered.

Claims 1727-1804 and 5396-5407 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1738 and 1777 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims are unclear regarding the use of the terms "part of", "portion of" and "the portion of the part of".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 3673

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1727, 1729, 1737, 1753, 1760-1762, 1766, 1768, 1776, 1792, and 1799-1801 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsai, et al. (U.S. Patent number 4,299,285).

1. The Tsai reference teaches a method for treating a hydrocarbon formation in situ comprising providing heat from one or more heaters to a portion of the formation; allowing heat to transfer, and producing a mixture as called for in claim 1727. Although the Tsai reference fails to explicitly disclose the total organic material weight percentage at least about 5%; this is inherent feature of coal, which includes major portions which are nearly 100% organic.

With regards to claim 1729; the Tsai reference teaches a pyrolysis temperature range within a section of the formation (300° is disclosed on col. 3, line 44).

With regards to claim 1737; the Tsai reference does not explicitly teach the transferring by conduction; however this is inherent in a solid substance such as coal. Even though the bulk of the heating in the Tsai method may be done by convection; it is apparent that some unfractured coal must remain, and thus the allowing heat to transfer comprises transferring heat substantially by conduction (that is, substantially within the unfractured portions).

With regards to claim 1753, Tsai clearly teaches the pressure greater than 2.0 Bar.

With regards to claims 1760, 1798, and 1799 and 1761; Tsai teaches combustion of the coal. Since most of the coal would be burned, the permeability would inherently increase to greater than 250 md in at least "a part" of the formation.

With regards to claim 1762, although the Tsai reference fails to explicitly disclose a Fischer Assay; it is apparent that the disclosed process will yield greater than 60%.

Regarding independent claim 1766:

2. The Tsai reference teaches a method for treating a hydrocarbon formation in situ comprising providing heat from one or more heaters to a portion of the formation; allowing heat to transfer, and producing a mixture as called for in claim 1766. Although the Tsai reference fails to explicitly disclose the total organic material weight percentage at least about 5%; this is inherent feature of coal, which includes major portions which are nearly 100% organic.

With regards to claim 1776; the Tsai reference does not explicitly teach the transferring by conduction; however this is inherent in a solid substance such as coal. Even though the bulk of the heating in the Tsai method may be done by convection; it is apparent that some unfractured coal must remain, and thus the allowing heat to transfer comprises transferring heat substantially by conduction (that is, substantially within the unfractured portions).

With regards to claim 1768; the Tsai reference teaches a pyrolysis temperature range within a section of the formation (see col. 4, line 54).

With regards to claims 1760, 1798, and 1799 and 1761; Tsai teaches combustion of the coal. Since most of the coal would be burned, the permeability would inherently increase to greater than 250 md in at least "a part" of the formation.

With regards to claim 1792, Tsai clearly teaches the pressure greater than 2.0 Bar.

With regards to claim 1801, although the Tsai reference fails to explicitly disclose a Fischer Assay; it is apparent that the disclosed process will yield greater than 60%.

3. Claims 1727, 1733, 1766, 1772, and 5402 are rejected under 35 U.S.C. 102(b) as being anticipated by Terry (U.S. Patent number 4,010,800).

The Terry reference teaches a method for treating a hydrocarbon formation in situ comprising providing heat from one or more heaters to a portion of the formation; allowing heat to transfer, and producing a mixture as called for in claim 1727. Although the Terry reference fails to explicitly disclose the total organic material weight percentage at least about 5%; this is inherent feature of coal, which includes major portions which are nearly 100% organic.

Terry also teaches a natural distributed combustor as called for in claim 1733.

Regarding independent claim 1766:

The Terry reference teaches a method for treating a hydrocarbon formation in situ comprising providing heat from one or more heaters to a portion of the formation; allowing heat to transfer, and producing a mixture as called for in claim 1766. Although

the Terry reference fails to explicitly disclose the total organic material weight percentage at least about 5%; this is inherent feature of coal, which includes major portions which are nearly 100% organic.

Terry also teaches a natural distributed combustor as called for in claim 1772.

Regarding independent claim 5402:

The Terry reference teaches a method for treating a hydrocarbon formation in situ comprising providing heat from one or more heaters positioned in heater wells to a portion of the formation; allowing heat to transfer, and producing a mixture as called for in claim 5402. Although the Terry reference fails to explicitly disclose the total organic material weight percentage at least about 5%; this is inherent feature of coal, which includes major portions which are nearly 100% organic.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1728, 1730, 1731, 1738-1750, 1754, 1755, 1767, 1769, 1770, 1777-1789, 1793, and 1794 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, et al. (U.S. Patent number 4,299,285).

With regards to claims 1728 and 1767; the Tsai reference fails to explicitly teach the superposition of heat sources. It is apparent that one of ordinary skill in the art would know that the heat sources should be spaced to substantially heat the entire formation. Any configuration of heat sources that provides heat to the entire formation would inherently cause superposition of heat; thus it would have been obvious to one of ordinary skill in the art at the time of the invention to have further modified the Tsai method to have included superposition of heat as called for in claims 1728 and 1767; in order to ensure that the entire formation is heated.

With regards to claims 1730 and 1769, electrical heaters are well known to heat air. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used an electrical heater with the Tsai process as called for in claims 1730 and 1769, in order to heat the air.

With regards to claims 1731 and 1770, surface burners are well known to heat air. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used a surface burner with the Tsai process as called for in claims 1731 and 1770, in order to heat the air.

With regards to claims 1738 and 1777; the Tsai reference does not teach the thermal conductivity; however, it would have been further obvious to one of ordinary skill in the art at the time of the invention to have practiced the Tsai method in a coal seam having a thermal conductivity of greater than about $0.5\text{W}/(\text{m}^\circ\text{C})$ as called for in claims 1738 and 1777; such a formation would be a desirable choice because it would heat more uniformly. The increase in conductivity is inherent.

With regards to claims 1739-1741, 1745-1750, 1754, 1755, 1778-1780, 1784-1789, 1793, and 1794; the nature of hydrocarbons produced from such heating is highly variable, and dependent upon many factors, not least of which is the characteristics of the coal. The components of the produced mixture are deemed to be the results of design variables, including coal characteristics and temperature.

5. Claims 1734 and 1773 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai in view of Elkins (U.S. Patent number 2,734,579).

The Tsai reference fails to teach the controlling the temperature and pressure wherein the temperature is controlled as a function of the pressure or the pressure is controlled as a function of the temperature.

Elkins teaches controlling the pressure in order to lower the temperature (col. 3, line 46); this is done in order to help prevent overheating. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Tsai process to have included the temperature is controlled as a function of the pressure or the pressure is controlled as a function of the temperature as called for in claims 1734 and 1773, and as taught by Elkins, in order to prevent overheating.

6. Claims ,1736, and 1775 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai in view of Kasevich, et al. (U.S. Patent number 4,457,365).

The Tsai reference fails to teach the heating rate. With regards to claims 1736 and 1775; it is known to heat at rates of less than 10°C per day, as shown by Kasevich

(figure 3). It is apparent that this low heating rate is desirable because it results in more uniform heating, and reduces the possibility of hot spots. It would have been obvious to one of ordinary skill in the art at the time of the invention to have further modified the Tsai method to have included heating at a rate of less than about 10°C per day as called for in claims 1736 and 1775, in order to achieve more uniform heating. The claim limitations drawn to the heating energy are nothing more than well known thermodynamic equations.

7. Claims 1732 and 1771 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai in view of Bennett (U.S. Patent number 3,680,633).

Tsai fails to teach the flameless distributed combustor.

Bennett teaches the use of a flameless distributed combustor to initiate combustion in a similar process. Bennett teaches that the flameless distributed combustor is advantageous because it provides for speedy ignition.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Tsai process to have included a flameless distributed combustor as called for in claims 1732 and 1771, in order to provide for speedy ignition.

8. Claims 1751, 1752, 1790 and 1791 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, et al. in view of Stoddard, et al. (U.S. Patent number 4,463,807).

The Tsai reference fails to explicitly teach the ammonia.

It is well known that ammonia is a byproduct of such heating of coal. This is taught by Stoddart. It is readily apparent that the amount of ammonia is dependent on many design factors, including the formation characteristics (hydrocarbon content, etc.). It would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the Tsai method, as modified, in a formation with characteristics allowing greater than 0.05% of the produced mixture to be ammonia, as called for in claims 1751 and 1790.

With regards to claim 1752 and 1791; it is well known that one of the chief uses for ammonia is fertilizer; thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have used ammonia produced from the coal seam for fertilizer as called for in claims 1752 and 1791.

9. Claim 1756, and 1795 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, et al. in view of Gregoli, et al. (U.S. Patent number 6,016,867).

The Tsai reference fails to teach the altering pressure to inhibit production of hydrocarbons having carbon numbers greater than about 25. The Gregoli reference teaches that in a similar in-situ processes, it is beneficial to use high pressure to break heavy hydrocarbons. It is well known that carbons having carbon numbers greater than

about 25 are considered to be heavy; and impede production because they are dense and viscous. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Tsai method to have included altering pressure to inhibit production of hydrocarbons having carbon numbers greater than about 25, as called for in claims 1756 and 1795, in order to improve production.

10. Claim 1763, 1764, 1802, 1803, 5396 and 5397 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, et al. (U.S. Patent number 4,299,285) in view of Van Meurs, et al. (U.S. Patent number 4,886,118).

The Tsai reference fails to teach the at least about 7 heat sources for each production well. Note that Tsai teaches: "*the principles are applicable to a multiple of interrelated injection and production wells*" (col. 2, line 8).

The Van Meurs reference teaches a similar in situ heating system, and further teaches that six or twelve heat sources for each production well significantly increases the production (col. 8, line 24).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Tsai method to have included at least about 7 heat sources disposed in the formation for each production well, as called for in claims 1763 ad 1802, in order to improve production.

With regards to claim 1998; the Van Meurs reference teaches the heat sources surrounding the production well; since this includes at least 3 sources this inherently includes a triangle. It would have been further obvious to one of ordinary skill in the art

Art Unit: 3673

at the time of the invention to have further modified the Tsai method to have included at least 3 sources in a triangle as called for in claim 1764 and 1803, in order to increase production.

With regards to claims 5396 and 5397; is apparent that the number of heat sources is largely a matter of engineering design. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used at least about 20 heat sources for each production well, as called for in claims 5396 and 5397, based on the desired heating rate and formation heat transmission characteristics.

11. Claims 1765 and 1804 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai, et al.; Van Meurs, et al.; and Salomonsson (U.S. Patent number 2,914,309).

The Van Meurs and Tsai references fail to explicitly teach the unit of heat sources in a triangular pattern and the plurality of units in a repetitive pattern. It is noted that the Van Meurs reference teaches the heat sources surrounding the production well, which would inherently include a triangular pattern.

Salomonsson teaches that it is desirable to have a repetitive pattern in order to cover the area evenly. It is apparent that this is beneficial in order to prevent hot spots. It would have been further obvious to one of ordinary skill in the art at the time of the invention to have further modified the Tsai method to have included a unit of a triangular pattern and a repetitive pattern of units as called for in claims 1765 and 1804; in order to cover the area evenly.

Allowable Subject Matter

12. Claims 1735 and 1774 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 1735, 1756-1759, 1742-1744, 1774, 1795-1798, 1781-1783, 5398-5401, 5403, and 5404 have been identified as including subject matter which is allowable over the prior art.

2. Claims 1756-1759, 1742-1744, 1795-1798, 1781-1783, 5398-5401, 5403, and 5404 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over copending Application Nos. 09/840,937; 09/841,170; 09/841,288; 09/841,300; 09/841,438; 09/841,441; 09/841,445; 09/841,495;

Art Unit: 3673

09/841,638; and 09/841,639. Although the conflicting claims are not identical, they are not patentably distinct from each other because the differences are obvious. Each of these copending applications has an independent claim which generally corresponds to a claim in the instant application. The copending applications do not call for the organic content; however the organic content value is obvious/and or inherent (as set forth in the 102 rejections above). A table listing the applications and the claims in the instant application which correspond is shown below:

Copending application	Corresponding claims
09/840,937	1757-1759, 1796-1798, 5398-5401, 5403, 5404
09/841,288	1757-1759, 1796-1798, 5398-5401, 5403, 5404
09/841,300	1743,1782
09/841,441	1756,1795
09/841,438	1744,1783
09/841,445	1757-1759, 1796-1798, 5398-5401, 5403, 5404
09/841,495	1744,1783
09/841,638	1756,1795
09/841,639	1742,1781

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

Applicant's arguments filed 4/14/03 have been fully considered but they are not persuasive.

With regards to independent claim 1727 and 1766; Applicant argues that the Tsai reference fails to teach the steps of "providing heat from one or more heaters" and "allowing heat to transfer from one or more heaters". Applicant argues that the definition of heater: "any system configured to generate heat in a well or a near wellbore region" excludes the heat systems taught by Tsai. Tsai teaches both the injection of hot air (e.g. col. 4, lines 49-70) to heat a near wellbore region (similar to the "surface burner" heater claimed in claim 1731) and subsequent in-situ combustion (e.g. col. 5, line 52). The plain language of applicant's definition of the term "heater" does not exclude either injection of hot air or fireflood. It is noted that applicant's claimed species of heater also include embodiments which heat the formation by in-situ combustion ("natural distributed combustor"). Applicant's characterization of examiner's remarks as acquiescence that Tsai fails to teach "any system configured to generate heat in a well or a near wellbore region" is unfounded: the examiner's remarks were a simply restatement of applicant's arguments. Tsai clearly teaches a system configured to generate heat in a well or near wellbore region.

With regards to claim 1737 and 1776; applicant's arguments have been considered, however the claim language calls for the method comprising allowing heat to transfer "to a part" of the formation (independent claims) and calls for "allowing the heat to transfer comprises transferring substantially by conduction". The claims twice use the open ended language "comprises" or "comprising"; and only limit the step of "allowing" by calling for a "part" of the formation. It is clear that the Tsai method allows heat to transfer by conduction to "a part" of the formation.

With regards to claims 1753 and 1792; 50 psi and 500psi are both significantly greater than 2 bar.

With regards to claims 1760, 1761, 1799, and 1800; applicant's arguments are not persuasive. It is noted that the claim language is extremely broad, and only requires a "part" of the formation. One could reasonably interpret the "part" of the formation to be an area adjacent to the linkage described by Tsai, and cited in applicant's remarks. With regards to applicant's request for basis in fact or technical reasoning to support the assertion that the increase in permeability is inherent; it is readily apparent that the injection of hot air and/or combustion increase the permeability by pyrolyzing and/or oxidizing/combusting some of the coal. It is noted that applicant's invention achieves the increase in permeability through heating at the same temperature ranges as taught by Tsai.

With regards to claims 1762 and 1801; Tsai indicates that the combustion continues until the coal is exhausted. If the coal is exhausted, then yields approaching 100% are to be expected.

With regards to claims 1738 and 1777; see figure 5 on page 275 of "Fuel a journal of Fuel Science" (applicant's citation A255) which clearly shows increasing thermal conductivity with temperature. Thus the increase is not "unexpected".

With regards to claims 1736 and 1775; applicant has asserted that "Tsai and Kasevich do not appear to teach or suggest *using a desired heating rate to calculate a maximum average heating energy/day...*" [emphasis added] Contrary to applicant's assertion, this step of "using" is not found in the claims of record. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

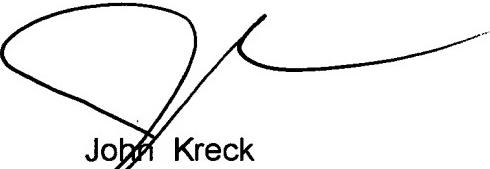
With regards to claims 1751, 1752, 1790, and 1791; one would find it desirable to produce ammonia because it is a saleable product.

With regards to claims 5396 and 5397, Van Meurs provides ample suggestion to one skilled in the art that more wells may be desirable. It has been established that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Kreck whose telephone number is (703)308-2725. The examiner can normally be reached on M-F 6:00 am - 3:00 pm.

Art Unit: 3673

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Shackelford can be reached on (703)308-2978. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3597 for regular communications and (703)305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-4177.



John Kreck
Examiner
Art Unit 3673

JJK
June 7, 2003